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tids (those lacking the accessory chromosome) regularly degenerate. This obviously has no connection with crossing, but is concerned with sex.

If we were to classify the causes of pollen sterility we might at least mention the following: (1) Crossing of sufficiently distinct species, (2) a condition of variability or mutability in the species, (3) the substitution of vegetative for sexual reproduction, (4) unknown physiological causes.

So far from it being improbable that mutability in a species should be accompanied by a certain amount of pollen sterility, we should be at a loss to account for the reverse condition, namely, a highly mutable species which had perfectly good pollen. For it is clear that in a mutating species various types of aberrant pollen grains must be produced, some of which may be unable to mature, and these will form shrivelled grains. This view is borne out by direct observations of pollen development in the *Oenotheras*. Moreover, some such gametes will form zygotes which are unable to develop, as has again been shown by direct observation in *Oenothera*. It follows almost from necessity that if the gametes of a mutable species are varying in many ways some of them will vary so as to produce pollen grains which are non-viable.

The view that a great increase in the vegetative methods of reproduction in a species may lead to or be accompanied by partial sterility of the pollen, is often expressed and apparently with reason. How narrowly such a relationship holds, however, could only be determined by statistical comparison. In the case of *Trillium*, *T. giganteum* apparently reproduces largely from rootstocks and *T. ovatum* chiefly from seeds.

From these preliminary observations it is clear at any rate that geographically isolated species do not invariably have good pollen, and that pollen sterility is by no means a sure sign of hybridity.

R. R. GATES,  
T. H. GOODSPEED

UNIVERSITY OF CALIFORNIA,  
March 16, 1916

## ANTHROPOLOGY AT THE WASHINGTON MEETING

### III

*Indian Ruins of the Republic of Guatemala:* FERNANDO CRUZ.

The ruins scattered throughout the territory of Guatemala are of two characteristic types: (1) Those properly classed as prehistoric, consisting of cities which were inhabited by races who occupied the territory centuries before the Spanish conquest and left notable vestiges of their civilization. (2) Those of a later period which were the fortifications used by the natives in their resistance to the Spaniards.

Those of the first class have been studied with care, at least the greater part of them; those of the second class have been viewed up to the present time with but little interest by archeologists. The ruins of this second class are simpler and do not reveal in their construction the same high grade of architectural beauty as those of the first class.

The author mentions the principal Indian ruins of Guatemala which have been studied, as well as those that have not yet been studied. He also gives a general idea of the arrangement of the cities, some of which he briefly describes.

With regard to the ruins of the cities contemporary with the Spanish conquest, the author notes that they reveal certain artistic decadence, and that in none of them is there to be found anything like the monoliths and sculptures of the former inhabitants. These ruins are of cities of a military character, fortifications intended for the resistance of the enemies in their domestic wars. The author indicates some of these ruins, and describes the condition in which they are to be found.

*Native Languages of Guatemala:* ADRIAN RECINOS.

After a few preliminary considerations with regard to the problems which demand the attention of the scientific men occupied in the study of the pre-Columbian epoch, the author proceeds to a study of the native languages of the races that have inhabited the Central American territory. He gives an outline of the Maya race and the grade of civilization which it attained.

The author does not believe that the native Central American languages can be described as dialects of the Maya. In his opinion they are perfect languages, with a construction, and some of them with a literature of their own.

Studying the different native races which inhabit Guatemala at the present time, and analyzing

their relations, the author concludes that they may be classified in the following groups: (1) The primitive language; the Sinca. (2) Maya-quiches, Mopán, Chol, Chortí, Quechí, PoconchíQuiché, Cachiquel, Zutijil, Pocomam, Mam, Aguacateca, Ixil, Uspanteca, Chuj y Jacalteca. (3) Languages of Nahuatl origin, Pipil, Alaguilac. (4) Caribes.

The author studies with care each one of these ethnic groups and the languages which they speak.

The report contains a bibliography and is accompanied by photographs of some of the types of Indians of Guatemala.

*Sources of Cuban Ecclesiastical History:* RT. REV. CHARLES WARREN CURRIER.

History of the Cuban Church divided into five periods. Sources for each of these are given by the author, who laments the irreparable loss of manuscripts relating to the earliest history of the church in the West Indies. Among the more noted sources should be mentioned the Archivo Nacional of Havana, especially the large collections of manuscripts in Escota's library.

*The Social Revolution of the Eighteenth Century in South America:* BERNARD MOSES.

The society of Spanish South America at the beginning of the nineteenth century had departed widely from that which its founders proposed to establish. A point was reached somewhere in the colonial history where the ideals of the mother country ceased to dominate completely the life of the colonies. The greater part of Spain's constructive work in colonizing was done in the middle period of her colonial history.

Spain aimed to reproduce the European form of society in America: class distinctions, a titled nobility, feudalism, and a state church with great authority. When the colonies had become conscious of their individuality as communities, the influence of their environment led them to revolt against a social organization suited only to other circumstances. This revolt was strengthened by Spain's excluding creoles and mestizos from high office, in spite of their fitness. Growth of mestizo class was encouraged by preventing unmarried Spanish women from emigrating. In spite of local differences among populations of different districts, the creoles, mestizos, and the more cultivated free Indians were thrown into one class by the action of the Spanish government. This union was favored by the fact that Spain had adopted the Indians as an element of colonial society. Primary elements of that society were the en-

comenderos and their Indian dependents. A middle class grew later, composed of landless creoles, mestizos and free Indians. The upper class embraced Spanish officials, the nobility, and the clergy. The creole-mestizo class grew by natural increase faster than the Spanish class by immigration. The line of separation became fixed, with the more rapid growth on the part of the creole-mestizo class. The physical growth was not more rapid than the growth of new ideals and new aspirations; whence the holders of ancient Spanish ideals became a declining minority.

Spain's persistence in governing according to her established rigid, exclusive policy drove the two sections of the population farther and farther apart. When the creole-mestizo class became conscious that its interests were opposed to the purposes of the Spanish government, the social revolution was complete on its spiritual side. The later discussions, agitation, rebellions and military campaigns were only required to convince Spain and the world of the reality of the change.

*A Forgotten Cereal of Ancient America:* W. E. SAFFORD.

Among the tributes paid to Montezuma by the various pueblos of Mexico were maize, beans, cacao, capsicum peppers, maguey syrup and bees' honey, salt, salvia seeds called *chian*, and *huautli* or *guautli*. Concerning the last-named, Albert Gallatin wrote as follows: "I can not discover what is meant by *guautli*. It is interpreted as being *semilla de bledo*; but I am not aware of any other native grain than maize having been, before the introduction of European cereals, an article of food of such general use, as the quantity mentioned (an annual tribute of 18 granaries full, each granary containing about 9,000 bushels) seems to indicate."

This seed was described in 1629 by Hernando Ruiz de Alarcon as "smaller than mustard seed" and ripening when the temprano maize begins to tassel. The Mexicans made of it certain dumplings (*bollos*), "which in their language they called *txoalli*, and these they eat cooked like their tortillas." It was of these seeds, ground and made into paste, or dough, and mixed with agave syrup, that they made certain idols in human shape which they placed upon altars and to which they made offerings of pulque, incense and lighted candles or splints of pitch-pine (*ocotillos*). The following day the idols were divided into small pieces and administered to the worshippers like communion. Padre Acosta (1590) speaks at

length of the use of this seed in the worship of the god Uitzilipuztli. In his honor an idol was made by young virgins, who "*molian cantidad de semilla de bledos juntamente com mays tostado, y despues de molido amassabanlo con miel.*" It was undoubtedly this grain which Alvar Nuñez Cabeza de Vaca found on the west coast, where it took the place of maize as a food-staple. He refers to the plant as *bledos*, and states that the natives ate nothing else than flour made of it. The identity of the plant called *huautli*, *uauhtli*, or *guautli*, has long been a mystery. In the economic collections of the United States Department of Agriculture are certain seeds collected by the late Dr. Edward Palmer at Imala, Sinaloa, bearing the vernacular name "*guante*," which are used for food when maize is scarce. They are ground into paste, mixed with brown sugar, and made into balls called *suaes*, which are wrapped in corn-husks and sold in the markets of Jalisco in strings called *rosarios de suale*. The seeds have been identified as those of *Amaranthus cruentus* L., a species closely allied to *A. caudata* L. At Colima Dr. Palmer saw a handsome variety with red spikes occurring both in cultivation and spontaneously, and in the vicinity of Guadalajara, both red and yellow varieties cultivated either alone or among maize. This species has a white-seeded form which was described by Sereno Watson as *A. leucocarpus*. It is interesting to note that very closely allied, if not identical, species, also having white-seeded forms, are cultivated as cereals in Tibet, the mountains of India, and in Peru and Bolivia.

*Food Plants and Textiles of Ancient America:* W. E. SAFFORD.

This paper is based on collections and observations by the author in Chile, Peru, Bolivia and Mexico, supplemented by the study of additional material from those countries and from various parts of the United States derived from ancient graves, cliff-dwellings, caves and prehistoric burial grounds. From prehistoric mounds and ancient village sites in the United States the only vegetable products preserved are those which have been charred by fire. From dry caves and cliff-dwellings of southwestern United States, food-products have been found in good condition, while from ancient graves of the arid coast region of Peru and northern Chile the organic material is in a remarkably perfect state of preservation. Not only such staples as maize, gourds, beans and peanuts,

but leaves of *Erythroxylon coca*, soft pulpy fruits, including the lucuma, the chirimoya and various starchy tubers have been collected.

In addition to the fruits, seeds, grains, tubers, roots and leaves, many of which have already been recorded by Wittmack and others, beautiful representations in terra-cotta of these and other vegetable products have also been unearthed, principally in the vicinity of Trujillo and Chimbote, Peru. Casts of maize, squashes, peanuts, etc., occur on burial vases. Often the original model has been reproduced so accurately that the varieties are clearly discernible.

The paper deals with actual specimens concerning which there can be no doubt, dug up from prehistoric graves and discovered on the sites of ancient habitations. Among the most interesting objects to be shown are specimens of the "almond of Chachapoyas" (*Caryocar amygdali-forme*); the balsam of Peru, found in a calabash in a grave at Ancon; a ceremonial planting-stick with an ear of maize attached, represented in terra-cotta; a remarkable carving in stone from the vicinity of Oaxaca, Mexico, representing ears of maize; and specimens of maize from prehistoric graves of Chile, Argentina and Peru; from various parts of the southern United States, including mounds of the Mississippi valley, and from ancient village sites farther north. In connection with textiles, cotton cultivated by the ancient Peruvians and by the Indians of our own southwest will be shown; and, among other fibers those of various eucæas, agaves and yuccas, of tropical America and southwestern United States.

*The Puma Motive in Ancient Peruvian Art:* CHARLES W. MEAD.

In the present state of our knowledge it is impossible to treat of the decorative art of the prehistoric Peruvians otherwise than as a whole, and no attempt has been made at a chronological sequence. The decorative motives most commonly employed are from the human figure, birds, fish and the puma, and these, together with such designs as undoubtedly owe their origin to the textile art, form a large part of the decorations found in Peruvian cloth and on the pottery vessels. The object of this paper is to show to what an extent the puma figures in Peruvian art, and to attempt the identification of some of the highly conventionalized designs.

*The Rise of the Inca Empire:* PHILIP A. MEANS.  
Explanatory introduction summarizing reasons

for accepting Gareilasso's rather than Sarmiento's version of the rise of the empire.

A short survey of conditions in the Andean area prior to the rise of the Incas.

The reigns of the earlier Incas, those before Inca Rocca, briefly considered, the accessions of territory gained by each one (except the first two) shown by maps. The reigns of the Incas from Rocca to Huira-cocha, inclusive, considered with special reference to the Chanca rebellion. A rather full enumeration of the conquests made by Pachacutec, together with a few remarks on the buildings erected by him and on the reforms in administration he introduced. An account of the reign of Tupac Yupanqui, with a presentation of the evidence pointing to his having reached some islands in the ocean out of sight of land. Concluding remarks, the empire at its zenith, the cataclysm.

A complete bibliography of works referred to in the paper.

*Notes of Venezuelan Archeology:* LUIS I. ORAMAS.

The present paper contains the description of archeological exploration made by the author in the western and southwestern part of Venezuela. The region explored comprises the states of Aragua, Carabobo, Cojedes, Portuguesa, Zamora and Apure.

The first part of the paper refers to the exploration of the islands and shores of the lake of Valencia and other adjacent places. The tumuli and mounds of earth made by human hands, and the implements and human remains found, are described. According to the author not all of the mounds contained bones and implements; in some of them only bones alone are found. The author refers expressly to the vessels which he discovered in the interior of the lake, vessels which the Indians filled with human ashes.

The second part of the paper is confined to the causeways and mounds of the plains of the states of Portuguesa and Zamora. The causeways or elevations of consolidated earth, of variable height and slope, are constructed in the lowlands, which are flooded in the rainy season. The causeways frequently communicate with mounds similar to those in the United States which are referred to as having been made by the mound builders. The author describes these mounds and the objects which he discovered in them after making his excavations. The author thinks that these monuments were not constructed solely as tombs, but also as sacred places, and chiefly as military ob-

servatories. The author describes in detail and separately the different causeways and mounds visited by him.

In the third part of the paper the author refers to the tribes to which belonged the aborigines who peopled the states of Portuguesa and Zamora.

The paper, which is accompanied by lists of works consulted, contains a series of photographs and a map of regions in which the explorations were made.

*Jade in Brazil:* ANTONIO CARLOS SIMOENS DA SILVA.

The prehistoric art products of jade and of rough jade, all found in the state of Bahia. The locality where these art products, in a certain abundance, and the rough material have been found, suggesting their existence in various beds. The variety of very hard rocks, their existence, accompanying the jade. Explorations made by the writer and trustworthy opinions on the subject given by the inhabitants, some of them differing from those presented by Mr. Ehristovam Barreto. The analysis and the specific weight of this green rock and its pretended curative property. The opinion of the Brazilian inland people about these art products.

*The Grindstones of the Primitive Inhabitants of Cabo Frio, Brazil:* ANTONIO CARLOS SIMOENS DA SILVA.

Some of the Indian tribes who inhabited formerly, by preference, the coast regions of Brazil. Their permanence in the old captaincy of "São Thome," to-day state of Rio de Janeiro. Their large grindstones in "Cabo Frio," county of this Brazilian state, where they prepared their arms and utensils. The accurate study of ten of these granite blocks, their measurements and their grooves.

References to the other class of Indian grindstones, named "shingles," which they carried with them.

*The Alaculufs and Yahgans, the World's Southernmost Inhabitants:* CHARLES WELLINGTON FURLONG.

The Fuegian Archipelago lying south of the Strait of Magellan and the Patagonian Archipelago, lying north of it, is a grand, desolate region with precipitous shores covered mostly with rain-soaked bog and impenetrable forests. We find among the four primitive tribes occupying it, two which are canoe peoples, the Alaculufs to the west and north, the Yahgans to the east and south.

The names of both these tribes having been made authoritative by the Rev. Thomas Bridges, the nomenclature of these regions indicates much of its history.

The Fuegian tribes were probably pushed south by stronger northern tribes, the canoe people down the Patagonian channels, the foot people of northern Tierra del Fuego and Patagonia down the Pampas of the latter territory. The Andes and the Strait of Magellan prevented communication between the various tribes and may have been responsible, in part or in whole, for the difference in their languages.

The Yahgan language (Yatigan) was found by the Rev. Thomas Bridges, who wrote a remarkable Anglo-Yatigan dictionary and grammar to consist of at least 40,000 words. This will stand as the greatest piece of linguistic work ever done in connection with these people.

Of the Alaculufs little is known. No white man, as far as is known, has ever spoken their language. They formerly seemed the most numerous of the Fuegian tribes. Now they are fast disappearing.

The Yahgans are the southernmost people in the world. Their environment made them canoe people and forced them to a nitrogenous diet through limited food supply; it also made them nomadic, in consequence preventing them from establishing large or permanent communities and from developing a tribal authority or any form of tribal government. Consequently they are socialistic. This lack of gregariousness has probably affected their religion, which is more or less animistic and without any form of worship. They are without chiefs or gods.

Many kitchen middens composed mostly of heaps of debris show their village sites. In one of these I found the world's most southern "perforated stone" with knobby projections. It is now in the American Museum of Natural History. The exhuming and study of these should be undertaken systematically.

The Yahgan's stunted stature may be accounted for by his squatting in canoes. Young Yahgan men of the present generation who have lived on land, herding sheep for a missionary rancher, are well proportioned.

The gap between primitive and civilized man I believe to be very narrow. The white man's contact with the Alaculufs and Yahgans has been their undoing, particularly through the forcing of clothes upon them, cutting their hair, and the introduction of syphilis and various venereal dis-

eases; measles, whooping cough and smallpox have swept them off like a plague.

The Yahgans have decreased in 46 years from about 2,500 to about 100. There still remains important scientific work to be done among these people, but whatever is done must be done soon.

*The Tribes of the Fuegian Archipelago:* CHARLES WELLINGTON FURLONG.

The Fuegian Archipelago—its nomenclature—its autochthonous inhabitants, and their linguistic divisions. The four tribes—the Alaculuf, Yahgan, Haush and Ona. Geographical distribution of these tribes. Origin of their tribal names. Brief consideration of their languages. Proto-history and history. Their environment, its effect on their distribution, physique, language and social organization. The effect of food on their social organization. The number of present and past aboriginal populations of the Fuegian archipelago. The effect of white civilization on the Fuegians, showing causes and effects.

*Fuegian and Chonoan Tribal Relations:* JOHN M. COOPER.

The Fuegian archipelago is inhabited by three distinct tribes—the Onas of Tierra del Fuego, the Yahgans of Beagle Channel and the southern islands, and the Alaculufs of the remaining territory. The three tribes speak languages that are lexically at least quite distinct, while from the physical and cultural standpoints the Yahgans and Alaculufs agree much more closely with each other than with the Onas.

The Onas show Tehuelchean affinities. They are divided into two subtribes, the Shilk'nam and the nearly extinct Mánekenkn, who, though culturally and physically uniform, speak quite different dialects.

A comparison of fifteen available vocabularies and some additional stray words shows with fair clearness that the Alaculufan tongue is spoken by all the non-Yahgan canoe-using Indians of the channels and inlets north and south of the Strait of Magellan, and up the west Patagonian coast as far as Port Grappler or Messier Channel.

The Chonos, now perhaps extinct, spoke a non-Araucanian and non-Tehuelchean language, but whether it was a distinct stock or an Alaculufan dialect is uncertain. Somatologically and culturally the Chonos were closely akin to the modern Alaculufs. Certain cultural elements, including apparently the plank boat, filtrated down the Chilean coast south of Chiloé from Araucanian sources.

*The Army Medical Museum and American Anthropology*: D. S. LAMB.

The Army Medical Museum at Washington began to receive Indian crania in 1867. In 1868 a circular was sent to medical officers of the army asking for Indian skeletons, crania and "curiosities." The crania received were measured and the results published. By 1877 there were nearly 2,000 crania in the museum. In 1884, in the progress of the study by another officer, a new method of measuring the capacity of the skull was devised, also a craniophore; and composite photographs of skulls were made. In 1887-88 a large number of crania and skeletons were obtained from prehistoric ruins in the valley of the Gila in Arizona. These also were measured and studied, and the results published. Altogether the basis of the several publications consisted of three to four thousand skulls.

*The Permanent Teeth, with special reference to American Children*: ROBERT BENNETT BEAN.

The teeth of the Filipinos appear from one to four years earlier than in American whites; of the French six months to one year earlier; of the American Indians one to six months earlier, and of the Germans six months to two years later.

The great difference between the Filipinos and other peoples is that the canines of the Filipinos erupt much earlier.

The girls are more precocious than the boys, but the difference is not so great among the Filipinos, and is greatest among the whites.

The canines and third molars are undergoing retrograde metamorphosis, as indicated by their size in prehistoric times and to-day. The Filipinos and Indians, in whom the canines and molars erupt early, are more like the prehistoric men than are the Germans and Americans, in whom the canines and molars erupt late.

Hyper-morphism, long head, nose and face and long occiput is a condition (1) of precocity, (2) of unsound teeth, (3) of greater age, (4) of the male sex, (5) of the American white, (6) of development more complete; whereas hypo-morphism, broad head, nose and face and large parietal, is a condition (1) of retardation, (2) of sound teeth, (3) of less age, (4) of the female sex, (5) of the Filipino and (6) of development less complete.

The following supernumerary teeth were seen:  
Among 146 Filipino girls, none.

309 German girls, none.

412 American girls, 1 upper and 1 lower incisor.

579 Filipino boys, 2 upper incisors, 1 upper canine.

324 German boys, none.

415 American boys, 1 upper incisor.

*Racial Elements in the Modern Population of America*: FRANZ BOAS.

Three types may be distinguished among the modern populations of the American continent—those in which the indigenous element forms a high percentage, those with a strong negro admixture, and those derived almost entirely from European sources. In comparison to these, the populations with strong Asiatic affiliations are unimportant. The regions in which the pure aboriginal population forms a large part of the modern population are few and restricted in extent. The political development of American states is very largely dependent upon the prevalence of one or the other of these types of population. The study of these types and the practical questions involved in their composition present a number of important problems. In these populations in which the aboriginal blood predominates or forms a large part the effects of racial mixture must be studied.

In all these regions the mixture proceeds in both directions, marriages between native men and European women and vice versa being of nearly equal frequency. Material for answering the biological questions involved is very inadequate. It has been shown that in the United States the physical development of the half-bloods is superior to that of the parental types, and that the fertility of the half-blood women is greater than that of women of pure race. The claim has been made that racial traits of the Indians and of the whites are inherited according to Mendelian laws; but no adequate proof of this contention can be given. In those regions in which there is a strong infusion of negro blood, conditions differ considerably in Latin America and in Anglo-Saxon America. In the former regions marriages between men and women of the two races are almost equally frequent. In the latter region marriages between white men and negro women form the vast majority. These conditions have a far-reaching influence upon the development of the resulting population. In the former case a permeation of the two races results in a mixed type, with almost equal amount of blood contributed by each side,

in accordance with the number of individuals in each race. In the latter case a constantly increasing amount of white blood will be found, because the fertility of the negro male is materially reduced while that of the white male is considerably increased. For this reason the result of the mixture consists in the development of a population in which white blood will more and more preponderate.

The problems in regions of pure white population are still different. The claim that the amount of mixture of European types that occurs in America is infinitely greater than in corresponding mixture that has occurred in previous times in Europe can not be maintained. Mixture of distinct types owing to migration and intermarriage has been the rule in earlier periods in Europe, and events in America are a repetition on a larger scale of earlier phenomena in the development in European populations. The stability of European social units is largely a phenomenon belonging to the stable agricultural conditions which prevailed until the beginning of the nineteenth century. With the industrial development this stability has been broken. Since conditions in America are quite analogous to those that have prevailed in Europe for several thousand years, there is no reason to assume any detrimental influence owing to the contact of different types in our country.

*Heredity of Stature:* C. B. DAVENPORT.

The study of the heredity of stature by Galton laid the foundation of biometry and has always been a favorite one for the biometrician who has believed it incapable of Mendelian analysis. Such analysis has, however, been attempted, and, although additional investigations have still to be made on the subject, it is even now clear that stature is not determined merely by general growth factors, but that there are five principal elements that are separately inheritable and form combinations of which the diverse statures of a hybrid family can be in major part explained.

*United States Census of Immigrant Stocks:* DANIEL FOLKMAR.

In 1910 were presented for the first time in the census figures directly relating to the ethnic composition of the white population of the United States, in so far as that is indicated by the native languages of the foreign born and their children in the United States. A great numerical preponderance is still held by the mother tongues of

northwestern Europe. The German is larger than the English or any other single foreign stock in the United States, as thus defined. It contributes more than one fourth of the entire last two generations of immigration. The English-Irish-Scotch-Welsh mother-tongue group numbers 10,037,420, and combined is only about 1,200,000 greater than the German mother-tongue stock.

The "new" immigration from southern and eastern Europe is still a small factor numerically. Taking as 100 per cent. the total white population of the United States in 1910, numbering 81,731,957, the so-called native stock constitutes 60.5 per cent. and the three great linguistic families of foreign stock from northwestern Europe constitute 27.1 per cent., making a total of 87.6 per cent. The elements from southern and eastern Europe constitute, therefore, less than 13 per cent. of the total. Of this, the two principal Latin mother tongues of the United States, the French and the Italian, contribute less than 5 per cent.

Of the total foreign white stock of the United States, 32,243,382, there are 8,817,271 persons who are of German stock. Of the foreign-born white element of the United States, 25.2 per cent. are reported as English, Irish, Scotch, Welsh and Manx in mother tongue and 21.8 per cent. are reported for the Germanic languages. Russian immigration is shown to be far more Hebrew (52.3 per cent.) than Russian (2.5 per cent.) or even Slavic.

The Spanish mother tongue contributes a much larger proportion of the total foreign-born white element than does the corresponding country of birth, Spain. The excess comes mainly from Mexico and other countries south of the United States. South America shows a decrease in the number reporting Spanish its principal mother tongue as represented in the United States. The contingent from Cuba is over 95 per cent. Latin—that is, mainly Spanish—while the representation in the United States from the other West Indies is, on the contrary, over 70 per cent. English, less than 10 per cent. being Latin.

*Anthropological Study of Old Americans:* ALEŠ HRDLÍČKA.

Old Americans, for the purpose of this study, are those whose parents and all four of whose grandparents were born within the territory of the United States and have no colored admixture.

Physical and to some extent also physiological investigations on this now very numerous, and at the same time rapidly diminishing, stock have



been carried on by the writer now for three years. The object of these investigations is twofold. In the first place they are expected to show what, if any, bodily and functional changes have taken place in the descendants of early whites under prolonged action of American environment; and, in the second place, they are to give us a series of much-needed standards, for use in anthropological comparisons.

The study is limited to healthy adults between 24 and 60 years of age, and no selection whatever is made beyond this requirement; in fact the work is purposely confined to the District of Columbia, where the old American population is derived from all vocations and from all parts of the country. The number of individuals of each sex to be examined was set at from 150 to 200, and the lower limit has now been nearly reached with both males and females.

The results of the research are most interesting. In general, it may be said that no homogeneous American type exists, even in the very oldest families; ancestral traits often persist in a remarkable manner; yet on the whole there are unquestionable evidences of a tendency towards the formation of a purely American subtype. In other words, there are evident, on the one hand, the power and persistence of heredity, while, on the other hand, we can also trace the effects of local American acquisitions. Yet there is little probability that a national type will develop in this country within the next few centuries; the old families are dying out or mixing with newcomers, and immigration will keep on pouring in fresh foreign strains. Even should immigration stop, there is little probability that a single American type would ever develop, but we should expect rather several subtypes, due to the basic regional differences in the components of the population, jointly with differences in environment.

*The Genesis of the American Indian:* ALEŠ HRDLÍČKA.

The author of this paper considers the question of the unity or plurality of the American race. In answering this question he decides in favor of the original unity of the Indian race in America. He bases his conclusion upon the similarities of language, culture, mentality and physique. The author next takes up the question of the antiquity of the race on this continent. He does not think that the Indian was autochthonous on this continent. He bases this belief upon the absence of

the inferior primates of the anthropoid type on this continent, also upon the subject of the unity of the human species and upon the circumstances that the primitive types of humanity living in Europe during the quaternary or glacial epoch could not have come from America. According to the author no human remains of geological antiquity have been demonstrated to exist on this continent.

The third question considered is the source of the elements that occupy America and the epoch of the occupation.

With respect to the first point the author passes in review the means of transportation of prehistoric man. The geographical situation of America with respect to the other continents; the anthropological characteristics of the American Indian, which compare with the primitive characteristics of the great ethnic groups of other parts of the world. The author concludes from these considerations that the American aborigines could have come only from Asia.

With respect to the epoch, the author thinks that no direct proof exists upon which to base an opinion. Considerations or proofs of an indirect character tend toward the idea that emigration to America could not have been effected before the European Neolithic period.

The manner or manners of the arrival of man to the new world and his subsequent dissemination and reproduction there constitutes the last point of analysis by the author. His opinion is that there was not one but many successive immigrations.

*Variations in the Lambda of the Crania of the Ancient Peruvians:* CARLOS MORALES MACEDO.

In the limited zone between the two occipitoparietal sutures and in the lambda itself, there are observed certain morphological variations, which present in the crania of the ancient races of Peru a frequency not surpassed in the crania of other peoples. The author is of the opinion that in the lambdoid region the Peruvian crania show an anatomical peculiarity.

The interparietal, the epactal and the lambdoids are treated separately. The study is based on the observation of 924 authenticated Peruvian crania, of which 551 belong to the National Museum of Peru, 102 to the Raimondi Museum (School of Medicine), Lima. The remaining 271 were collected by the author in the ruins of Pachacamac and the huacas of Ancon.

The author's conclusions are:

The interparietal is found in 2.7 per cent. of Peruvian crania, which is somewhat higher than in non-Peruvian crania. The crania from Pachacamac, Ancon, Lima, etc., and those from the coast region in general show this anomaly with greater frequency than crania from other regions of Peru.

The wormian lambdoids are present in 56.2 per cent. of Peruvian crania. In the other 43.8 per cent., the lambdoid suture is frequently very complicated. It is possible that the presence of wormian lambdoids in Peruvian crania may have been favored by cranial deformation. The wormian bones of the sagittal, coronal, squamosal and occipitomastoid sutures exist in the crania of Peru approximately equal to that of the crania of other countries.

With regard to the epactal, he draws the following conclusions: (1) The epactal is present in 21.6 per cent. of Peruvian crania, which is a much higher proportion than in other crania. (2) In crania of genuine Aimara origin, the epactal appears with less frequency than in the crania of other Peruvian origin. (3) It is possible that the greater frequency of the epactal in Peruvian crania may have had for cause the deformation of infantile crania. The deformation would disturb the nutrition of the bone, weakening the tissue of the occipital; such a trophic change would be transmitted through heredity in the form of a predisposition to anomalies in the lambdoidal region.

*Trepanation of the Cranium and its Representation in Pottery of Peru:* CARLOS MORALES MACEDO.

The evident antiquity of trepanned crania leads to the belief that this was the first operation of major surgery practised by ancient man. Ancient Peru was the place where the art of trepanning was cultivated on the largest scale. From the ancient cemeteries of this country were obtained the greater part of the crania that show trepanation, found to-day in the museums of America and Europe. The most interesting and complete collection among these is the one which Dr. Julio Tello obtained in the canyon of Huaro-chiri and which Dr. Aleš Hrdlička exhibited recently in San Diego, Cal. The ancient Peruvians have not left us many data with respect to the practise of trepanning the cranium. This is due perhaps to the fact that trepanation was at its height when the ceramic art was but little advanced and to the fact that the Aimara Indians did not cultivate to any high degree the plastic

arts. The author has found in a cemetery of Casma a piece of pottery which represents the act of trepanation, which may be described as belonging to the most ancient and imperfect epoch of the ceramic art of Chimú.

The piece of pottery referred to is of a black color, of medium size, and belongs to the class called "silvadores" (whistlers). On one side there is a figure of a man seated with a human head between the legs. With the left hand he is holding the head in position, while with the right he is using a heavy instrument apparently of stone. This instrument is of a length somewhat greater than the width of the head and terminates in a sharp curved edge in the form of a half moon.

*Artificial Deformation of the Cranium in Ancient Peru:* CARLOS MORALES MACEDO.

This paper on the practise of cranial deformation among the ancient inhabitants of Peru contains several chapters. The first treats of similar deformations among other ancient peoples. The second gives an account of the existence of those operations in Peru during the pre-Columbian epoch. The third relates what the early chroniclers had to say on the subject. The fourth is a study of ceramic art in this connection. The fifth treats of the origin and antiquity of the operation in Peru. The sixth gives a morphological classification of deformed crania in Peru. The seventh and eighth study two forms of deformation. The ninth analyzes the asymmetry of deformed crania. The tenth describes methods employed for deforming the head of the child. The eleventh considers the duration of the compression. The twelfth discusses the motives which inspired the deformation. The thirteenth gives the conditions of the infantile cranium which facilitates the deformation. The fourteenth treats of a mechanical process of the deformation. The fifteenth treats of the effect on health produced by the deformation. The sixteenth reviews the physiological effects and the seventeenth and last considers the question of the inheritance of cranial deformations.

*The Fossil Man of Cuba:* LOUIS MONTANÉ.

A young priest of Tunas de Sancti Spiritus, Cuba, discovered in 1884 in the mountains of Banao a primitive burial ground, from which Dr. J. F. Torralba received in the same year a small box of fragments of bones. This place, known by the name of Gruta del Burial, was studied by Dr. Montané. It consists of a cavern 7.50 meters long, 4.50 deep, and at its entrance 10 meters high.

According to Dr. P. Saterain, who made a geological study of the cavern, it is of the same calcareous composition as the mountains in which it is situated. It has not been possible to determine the age of the cavern because there were no fossils in it; and the inclination of from 60° to 70° of the calcareous strata, the tertiary strata visible in slopes of the mountain, and other circumstances permit the conclusion that in geological formation it belongs to the secondary and probably to the Jurassic period.

In the bottom of the cavern, resting on a layer of ashes, there were found a number of skulls arranged in a semicircle, and concentric to those, the large bones arranged in the form of an X, and in the same way the short and flat bones were arranged, and at the center the bones of the pelvis. Three of the skulls were studied in Paris under the direction of Drs. Verneau and Rivet in 1906.

In the cave was found also the fragments of a human mandible and a flat stone; and mixed with human teeth a number of other teeth of a strange form. The objects mentioned will be placed on exhibition for the benefit of the members of the congress. The fragment of the human mandible was studied in 1911 by F. Ameghino, who believes that it belonged to a species of genus *homo* different from those known up to the present time. He gave it the name of *Homo cubensis*. In the opinion of Dr. Roth, of the Museo de la Plata, the mandible and the teeth are those of a species of ape extinct in the island of Cuba, where in historic times apes have not been known.

The study of Dr. Montané is accompanied by an extensive bibliography.

*Indian Ceremonial and other Practises on the Human Body*: WALTER HOUGH.

Practises on the human body are almost universal, such as tattoo, perforation of lips, nose, cheeks, ears, breasts, etc.; filing, breaking or ornamenting the teeth; shaping the skull, nose, legs, etc.; excoriations by knife and fire, etc. They may be classified as (1) surgical, (2) cosmetic, (3) ceremonial, and (4) thaumaturgic practises, and cause more or less profound modifications in parts of the body. It is probable that they are all based on nature religion. Environment has an important effect on the practises treated in the paper. The majority of mutilative practises occur among unclothed peoples. In America they are found sparingly in the United States and become increasingly prevalent in Mexico, Central America and tropical South America, repeating the phe-

nomena of the East Indies, Oceanica, Africa and such regions as are inhabited by unclothed peoples. Among clothed peoples the visible parts of the body are subject to modifications in the following order: Ears, nose, lips, facial surface and ankles. The practises on these parts survive the adoption of clothing, while tattoo deteriorates or becomes obsolete. The paper describes American practises and illustrates the practises of other parts of the world for comparison.

*Preliminary Remarks on the Skeletal Material Collected by the Jesup Expedition*: BRUNO OETTINGER.

In preliminary remarks on the skeletal material collected by the Jesup Expedition of the American Museum of Natural History, the speaker points out the variety of racial elements combined in the Indian population of the northwestern section of this continent. So far as the skulls are concerned, the morphological diagnosis of the face will aid materially in conducting investigations. Racial affinities with the peoples of northeastern Asia can be demonstrated in consideration of the bodily proportions manifested in the size and form of the long bones.

*One Aspect of Present Evolution in Man*: PAUL POPENOE.

Pre-Columbian America was free from the most serious contagious diseases of Europe: tuberculosis, smallpox, measles, etc.; consequently the native population had undergone no evolution or immunization against them. When brought by the conquerors, these diseases immediately began to kill the natives much more rapidly than they did the Europeans, among whom natural selection, by eliminating the least resistant in each generation for many centuries, had produced a strong resistance. In the markedly different death-rate of native Americans and Europeans, with respect to these European diseases, we can see evolution in man actually in operation, and working rapidly to produce a more disease-resistant race in the New World. The high death-rate of negroes in the United States from tuberculosis, as contrasted with the death-rate of whites, offers another illustration of natural selection at work. In the light of such facts, it would be erroneous to suppose that evolution in man has slowed down or ceased; in some directions it is probably proceeding more rapidly to-day than ever before.

GEORGE GRANT MACCURDY  
(To be concluded)